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7.8-10025

DEPARTMENT OF SURVEYS AND LANDS

CR-155249

LANDSAT REPORTJANUARY 1977I INTRODUCTION

Title :- An Aid to the Development of Botswana's
Resources.

Investigation Number :- 28070

Author :- J.A. Raffle

Organisation :- Department of Surveys and Lands,
Botswana Government

Report :- Quarterly Progress Report No.4 dated
January, 1977.

(E78-10025) AN AID TO THE DEVELOPMENT OF
BOTSWANA'S RESOURCES Quarterly Progress
Report (Department of Surveys and Lands)
7 p IC A02/ME A01

CSCL 08F

N78-12501

Unclass

G3/43

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28070

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OCT 17 1977

SIS/902.6



II TECHNIQUES

See Report No.1, Paragraph II

- (i) Throughout the period of the investigation, the basic procedures listed in previous Reports have been adhered to and this has resulted in the compilation of the Botswana Landsat 2 Index. This Index now consists of sixty four (64) pages with a simple graphical portrayal of one hundred and ninety nine (199) frames.
- (ii) Coverage of the country is not complete. A small section of the Eastern boundary has been omitted. This omission is due to a discrepancy with geographical data. (Department letter C.1/3-54 dated 19 October, 1976 refers.) The uncovered area was shown on the map sent to Dr. Price under cover of Departmental letter C.1/3-92 dated 9th May, 1977.
- (iii) An additional index for frames received which cover areas outside Botswana has also been compiled. This index comprises twelve (12 pages) with details of seventeen (17) frames covering surrounding areas of Botswana.
- (iv) The production of 1:500 000 scale dye-line enlargements has now been discontinued. Most investigators prefer to use bromide prints at 1:1M scale to supplement medium scale air photography.

III ACCOMPLISHMENTS

See Report No.1, Paragraph III

- (i) The production of the Botswana Landsat 2 Index was aimed at the selection of most suitable frames for future cartographic work.
- (ii) To supplement the simple graphical index outlined above, a further index has been compiled. This records the dates and numbers of each frame with details for Band 7 of:-
 - (a) Percentage, Cloud Cover
 - (b) Percentage, Bush Fire and Burnt Area.
 - (c) Percentage, Haze
 - (d) Contrast

Brief notes on the geographical location of the frame are also given. This index will be used as a basis for the selection of frames to be used for future cartographic work.

- (iii) The index will be checked against detail abstracted from the Cumulative Non U.S. Standard Catalogue (Departmental letter C.1/3-92 dated 9th May 77 refers). This concerns certain anomalies which were noted during the comparison of data. (This work was actually completed after the date of the report ie. 31 January 1977.)

IV SIGNIFICANT RESULTS

See Report No.1, Paragraph IV

An addendum to this report is included which gives details of progress made after 31 January 1977.

V PUBLICATIONS

See Report No.1, Paragraph V.

The first draft of the Report for the Journal of the Botswana Society has been prepared.

VI PROBLEMS

See Report No.1, Paragraph VI

- (i) No progress has been made on the recruitment of suitably qualified staff.
- (ii) Time is still a problem
- (iii) Progress has been made on this matter.
 - (a) All correspondence has been sent to the Landsat Results Manager, Dr. R.D. Price.
 - (b) Correspondence has been sent through the American Embassy in Gaborone.
- (iv) The problems with computer printouts still remain. A copy of the Cumulative Non U.S. Standard Catalogue was recently received. This is a massive publication. However only ten frames listed in the work apply to Botswana!!.

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VII DATA QUALITY AND DELIVERY

See Report No.1, Paragraph VII

Six (6) Frames listed in Report No.3 were in fact received at this office on 7 December, 1976. No further frames have been received.

VIII RECOMMENDATIONS

See Report No.1, Paragraph VIII

- (i) This recommendation has been accepted ie. Dr. R.D. Price
- (ii) No progress has been made on this recommendation.
- (iii) 1:1M Negatives are to be ordered. (This has now been done)

IX CONCLUSION

See Report No.1, Paragraph XI

Landsat data was supplied to the following agencies for work in Botswana during the period of this Report.

Job No. 13223 dated 5 Jan 77 Ministry of Local Government and Lands

Job No. 13315 " 19 Jan 77 Ministry of Agriculture

J.A. RAFFLE
PROJECT COORDINATOR
GABORONE.

26th September, 1977

DEPARTMENT OF SURVEYS AND LANDS

LANDSAT 2 REPORT

Since Landsat 2 frames began to arrive in Botswana they have been available for use by the Department in connection with the Botswana National Mapping Programme. A report on this work prepared by the Map Production Officer reads as follows:-

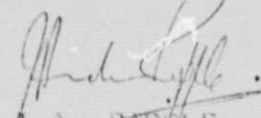
Landsat imagery has already been used to supply Geographical Position of detail in areas of little or no control at scales of 1:1,000,000 from which the 1:1/2 million is being produced. The 1:350,000 Okavango also utilised the imagery to determine the extent of the ancient shore line of Lake Ngami and to give a better topo answer to the shape of the Linyanti Swamp area. The imagery helps immensely in giving an overall picture of large topo features e.g. fossil valleys which might otherwise be missed on relatively large scale (1:70,000, 1:50,000) photo coverage where such detail appears fragmented. The 1:1,000,000 negatives ordered and received will be enlarged to 1:250,000 and used as a base either in the form of a photomap or as the topo geographical position control for a line map for the 1:250,000 series eventually to cover the whole of Botswana. The imagery has also been used to determine the position of detail around geographical value intersections and so help to control an uncontrolled mosaic covering 62 sheets, $\frac{1}{2}^{\circ}$ EW \times $\frac{1}{4}^{\circ}$ NS. It has also been useful in showing up pans, a very important consideration here, that might otherwise easily be missed when the existing air photo coverage is taken in the dry season. It has also helped us to determine the position of cattle posts, most of which are named, by being able to pick out the areas of extra grazing around the borehole areas where the cattle posts (CPs) are usually situated.

This report gives some idea of the uses to which Landsat imagery is being put in this Department. The Mapping Programme is a continuous operation and imagery is another tool which is now available to the cartographer.

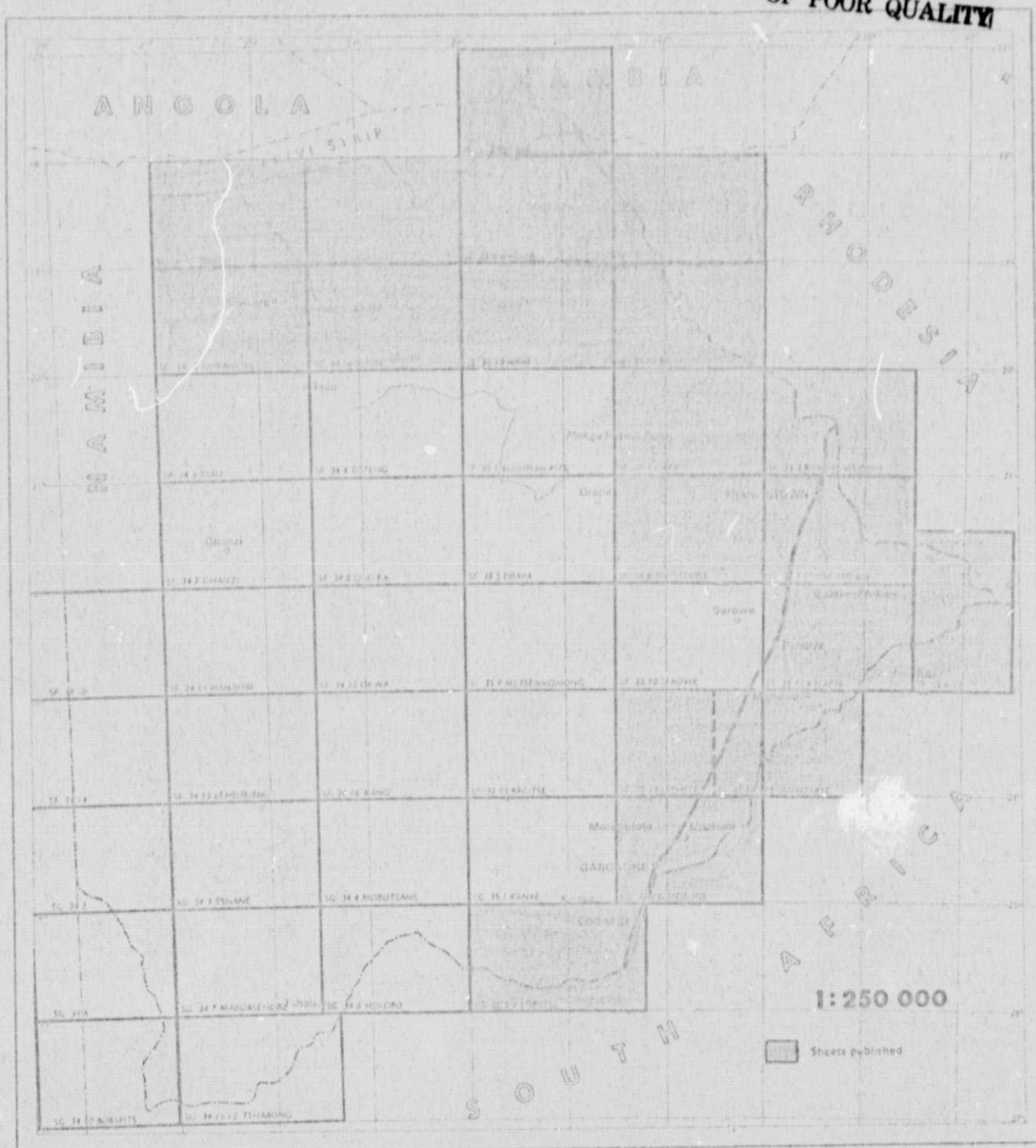
Attachment:- Index Map

DEPARTMENT OF SURVEYS AND LANDS
GABORONE

26 September, 1977


J.A. RAFFLE

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To order:

State the required sheet number and name.
For example, SF-35-11 Palapye

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SAVINGRAM

FROM:

Director of Water Affairs.

TO:

Director of Surveys and Lands.

B. H. Wilson
(for D.S.A.)

20th September, 1977

REFERENCE No: HY/WERT

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Landsat Investigation of Okavango Delta

I wish to report that this Department is making good progress in its application of LANDSAT to problems of the Okavango Delta.

In 1976 a 2 1/2 year hydroecological study of the Okavango Delta by UN was completed. This included on the ecological side repeated observational flights on a 5km grid over most of the area and a considerable amount of localised ground truth. On the hydrological side it has included the development of a simple mathematical model. In its calibration stage the model has made use of assessment of gross swamp flooded area from Landsat at a particular date.

The Department of Water Affairs is now concentrating attention on some 30 sample grid squares of 5km side, corresponding to the previously mentioned ecological Grid. Using hand held, graduated microscopes, (Hensoldt - Wetzlar) with 8 x magnification, and two, simple, locally made light tables, two Botswana citizens, guided by a qualified Canadian volunteer Mrs. Mary Rigby, are analysing each 1km sub-square for every available date for percent coverage at the different degrees on the grey scale. Bands 5 and 7 are used on 1 / 1 million positive transparencies.

While it is too early to draw conclusions it is hoped that by suitable selection and correlation it will be possible to feed LANDSAT obtained data on flooded area and water level into the mathematical model so that a comprehensive description of the delta's performance can be obtained for any time.

It is much regretted that Mr. Morris Deutsch of U.S. Geological Survey was unable to visit Botswana when he was in Southern Africa. As soon as this Department learned of his presence in Africa we contacted the U.S. Embassy, but apparently his itinerary had by then been finalised. I believe he would have been very interested to see the work going on here and the keenness of the Botswana citizens engaged on it. We would also have much appreciated his advice.

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with QPR No A.
JMB
23 Sep 77

DEPARTMENT OF SURVEYS AND LANDS

INTENTION

Director of Water Affairs.

B. H. Wilson
(for D.W.A.)

Director of Surveys and Lands.

20th September, 1972

REFERENCE No: HY/HERT

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